DE 195 38 468 A 1

Title: Method for gluing components, and composite structure created with said method

[page 2, lines 3-18]

In numerous technical fields, components are exclusively connected or secured with glue. This method is replacing conventional fastening methods such as welding, soldering, screw connections and the like. Adhesives that can meet a wide variety of requirements are becoming necessary in a steadily increasing number of applications.

Special glues can be required for special components, or for a special environment to which a glued site or a glued component is exposed. Such external conditions can include severe temperature fluctuations, high temperatures and a humid or chemically harsh environment. The need for the glued component to function or be handled comfortably can place requirements on the glued site in terms of stability, elasticity and thermal expansion, as well as electrical or thermal conductivity. The handling qualities of the glue are also critical, particularly its viscosity, shelf life, working life, hardening speed, hardening conditions and the number of components required to produce the glue.

Certain high-temperature applications require a glue that can be used for the large-surface gluing of metallic and/or ceramic components; the glued site must possess a sufficiently high shearing strength at temperatures of about 160°. To this point, thermally-hardenable, two-component resins have been used in these cases.

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It is the object of the present invention to disclose a method for gluing metallic or ceramic components, which can be executed simply and quickly on curved or overhanging surfaces, and which produces a temperature-stable glued site.

In accordance with the invention, this object is accomplished by a method defined in claim 1. The further claims describe advantageous embodiments of the invention, and a component composite structure that can be produced with the method.

A glue on an epoxy-resin base that possesses a dual hardening mechanism is used for the method according to the invention. When UV-initiated, the glue exhibits a cationic hardening that causes the glue to gel within a few seconds. The components are therefore joined with the aid of a glue layer, then oriented in a specified position and hardened with UV light. Even large-surface glued connections of metallic or ceramic components can be fixed quickly and reliably, although their glued sites are for the most part shaded from UV light. The glue can be applied with different layer thicknesses, and can be completely hardened as a highly-filled system, with thick layers, although UV light is only absorbed in the uppermost layer regions.

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In one application example, a plurality of components comprising a rare-earth permanent-magnetic material is to be glued to a metallic carrier.

Fig. 1: A layer 3 of glue is applied, e.g., with a dispenser, to a metallic carrier 1, in the region of a glued site 2. The quantity of glue is preferably selected to result in a lateral bulge after the component has been positioned.

Fig. 2: A flat component 4 comprising, for example, a rare permanent-magnetic earth material is placed on the glue layer 3, and oriented to assume a predetermined desired position. For a few seconds, a UV lamp effects a UV irradiation 5 with a radiation intensity of about 50 mW/cm^2 in the UV-A range. The component 4 is now fixed, and is additionally secured against sliding by the protruding bulge.

[page 5, lines 10-14]

The inventive glue mixtures and the composite structures created therewith are thus optimal for both a high-temperature application and applications involving a high mechanical load-bearing capability of the glued site. An example of a preferred application is the aforementioned gluing of components comprising a permanent-magnetic material to a cylindrical shaft to form contactless magnetic couplings, as are used especially in pumps for hot liquid media.

[page 5, lines 16-31]

CLAIMS

1. A method for the large-surface gluing of components comprising the same or different ceramic or metal materials,

- the method employing a glue that is hardened with thermal or UV initiation and comprises the following components:
  - A) 30 to 90% of a highly-functional, aromatic epoxide;
  - B) 5 to 50% of a cycloaliphatic mono- or divinyl ether;
  - C) 25 to 0% of a diglycidyl ether on an aromatic bisphenol base;
  - D) a latent thermal initiator;
  - E) a photoimitator that releases cations when UV-initiated; and
  - F), G) and H) additives typically selected for the respective reaction resins;
- in which the components are joined with a layer of glue, and oriented; and
- in which the components are fixed through the hardening of the glue with UV light, and the glue is thermally post-hardened.